Matthew Alberts

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EDUCATION:

Western Michigan University — Western Michigan University, Kalamazoo, MI
Bachelors of Science in Computer Engineering (3.86/4.0) — April, 2004

EXPERIENCE:

NASA Academy, Goddard — Goddard Space Flight Center (GSFC): Greenbelt, MD — Summer 2004
Research Assistant: NASA Center for Computational Sciences (NCCS)

- Instantiated new development model separating design from implementation for human interactive web applications
- Streamlined network interactions using persistent structures
- Introduced highly secure authorization and data encryption for any network transaction
- Enabled user and managerial level real-time reporting ranging from personal information of all members on a project to current processing resources available of four different parallel machines

NASA, Goddard — Goddard Space Flight Center (GSFC): Greenbelt, MD — Fall 2003
Research Engineer: Electromagnetics Branch

- Created a custom Finite Element Analysis model to study hysteresis gyroscopes in the Hubble Space Telescope based on linearly smoothing a scalar Jiles-Atherton hystereis model through time with rotation
- Designed a graphical user interface to the hysteresis FEA simulation providing both extended usability and life to the simulation software
- Provided web accessible documentation concerning operating or updating modules in the hysteresis FEA model

Western Michigan University — Western Michigan University (WMU): Kalamazoo, MI — Seasonally 2001, 2002, & 2003
Senior Technician: Information Services (DOSA-IS)

- Maintained computer resources on multiple platforms distributed across Western Michigan University (WMU)
- Interacted with users locally and remotely to actively debug errors in personal and distributed computer resources across WMU
- Managed newly hired student technicians, including accountability for training new hires
- Developed custom solutions, scripts, and utilities to automate services provided

NAVSEA, Corona — NAVSEA: Corona, CA — Summer 2002
Warfare Assessment Module Designer: Performance Assessment

- Constructed mathematical sweep model to fill polygons smoothly with little pixel repetition for application in warfare assessment of naval engagements
- Integrated mathematical model into a conversion construct to allow output of naval interaction into several standard graphics formats
- Laid foundations for a cross platform (windows and UNIX) utility to observe naval interaction information in a graphical user interface, providing the benefit of movie-like playback
- Attached printing services to the graphical user interface to complete a package that would allow movie-style playback of naval interactions with printable or savable screen shots for any frame desired

Western Michigan University — University Computing Services: Kalamazoo, MI — Seasonally 1999 & 2000
Senior Lab Specialist

- Solved general usage issues for all software packages used on Western Michigan University computers, including Microsoft, Macromedia, Adobe, and Mathworks products for Apple, Microsoft, and UNIX operating systems
- Trained newly hired employees for general debugging issues and lab policies

COMPUTER EXPERIENCE:

Platforms	Microsoft Windows (All Versions)	Mac OS 8/9/X		Unix Linux	
	Cygwin	Novell			
Languages	**Scripting**	**API/GUI**	**Analysis**	**Hardware**	**General**
	BASH/SH/CSH Shell	Glade	Crystal Ball	ABEL	Bison/Lex
	Perl Script	Gnome API	MatLab	Assemble x86	C/C++
	Perl-CGI	GTK API	MathCad	Assemble 80296	HTML
	Java Script	Java SDK	Maple	Basic Stamp II	Java
	J Script	TCL/TK	Orcad	Mentor	LISP
	Q Basic	Visual Basic	P-Spice	VHDL	Perl
	VB Script (VBS)	Visual C++		Xilinx	PROLOG
	Visual Basic for Applications (VBA)	Visual Java			Yacc/Yapp
	Windows Script Host (WSH)	Windows API			
Hardware	Intel 80296 Microprocessor		Standard TTL Logic		
	Xilinx 10895PC84 PLD		Analog to Digital & Digital to Analog Logic		
	Garmin GPS25-LVS GPS Receiver				

DESIGN PROJECTS:

Beowulf Cluster Applications	Created a 48 node Highly Parallel Computer (HPC) with a classic Beowulf topology. The super computer was benchmarked used video compression algorithms to determine areas of improvement and to give the machine a practical purpose.
GPS Correction Center	Designed custom hardware and software to interface a Garmin GPS -25 LVS GPS receiver to a modified HPC to produce GPS correction terms.
Navigational Gyroscope Modeling	Designed and built a custom application based on a scalar Jiles-Atherton Model for hysteresis to allow Goddard Space Flight Center to investigate satellite navigational gyroscope failures in both the Hubble Space Telescope and the GOES Satellite systems.
Process Scheduling and Network Optimization	Redeveloped the interaction mechanisms used at Goddard Space Flight Center to separate design from usage from functionality concerns. This includes optimizing all database interactions and improving layout for improved security and usability, and implementing a new process scheduling paradigm on the HPC's housed at Goddard Space Flight Center.
Graphical Naval Warfare Assessment Module Development and Encapsulation	Constructed a mathematical model for sweep filling pixels on a screen to provide a smooth image without an excessive line count by taking advantage of coordinate symmetry about the center of a polygon mass. The algorithms were encapsulated in a graphical user interface to provide movie-style playback of naval engagement data with the ability to convert the polygon mass into formats suitable for printing or saving.

AWARDS:

- Eagle Scout – January, 1999
- Mathematics Department Award – Honorable Mention – WMU – January, 2000
- Lee Honors College Overseas Research Grant – Belize Ecosystems – June, 2000
- Phi Kappa Phi Member – Western Michigan University – December, 2000
- Golden Key International Honor Society Member – Western Michigan University – January 2001
- Physics Department Award of Excellence – Western Michigan University – August, 2001
- Lee Honor's College Award – supporting HPC development – August, 2002
- Michigan Space Award – supporting construction of a GPS correction station -- April, 2003
- Undergraduate Student Research Program – Goddard Space Flight Center – August, 2003
- Lee Honor's College Award – supporting GPS correction station construction – December, 2003
- Electrical and Computer Engineering Department Presidential Scholar Award – 2004
- Electrical and Computer Engineering Department Outstanding Student Award – 2004
- NASA Academy – Goddard Space Flight Center (Summer Session 2004) – April, 2004
- Michigan Space Award – supporting research at the NASA Academy -- April, 2004
- Lee Honor's College Graduate – Western Michigan University – April, 2004
- Dean's List for Academic Excellence - Western Michigan University – August, 1999:August, 2004